SANDAKANIA 1 (1992) : 15-21

The Poring Puzzle: *Gigantochloa levis* and a new species of *Gigantochloa (Gramineae : Bambusoideae)* from Peninsular Malaysia

K.M. Wong

Forest Research Centre, Sepilok,
P.O. Box 1407, 90008 Sandakan,
Sabah, Malaysia

Summary. Two distinct large bamboos, from Sabah and Peninsular Malaysia, have previously both been identified as *Gigantochloa levis* (Blanco) Merr., the type of which is from the Philippines. A comparison of flowering material against the type has revealed that the Sabah taxon, also cultivated elsewhere in Borneo, is correctly identified whereas the Peninsular Malaysian taxon is a new species, here named *G. thoii*.

Gigantochloa levis is a name which has been applied to big bamboos, thought to represent one and the same species, from Peninsular Malaysia (Holttum 1958; Widjaja 1987), Borneo and the Philippines (Widjaja 1987), which yields good edible young shoots popular with local people in each area. The Peninsular Malaysian taxon is commonly called Buloh (bamboo) betung, in common with the other big bamboo popularly cultivated for its edible shoots, *Dendrocalamus asper* (Schult.) Backer ex Heyne. The Philippine taxon is commonly called Boho in the Philippines and the Bornean taxon, probably most widely encountered in Sabah, is popularly known as Poring (in the Dusun/Kadazan language) although in Brunei the same bamboo is called Buloh betung in the Brunei and Dusun languages.

When Poring was studied in the field in 1986 it became evident that this bamboo was in vegetative characters different from the Peninsular Malaysian taxon. The Peninsular Malaysian "G. levis" has white-waxy culms with only scattered dark hairs near the upper part of internodes, whereas the Poring bamboo from Sabah does not have any wax evident even on young culms, and the basal internodes have a dense covering of coarse dark brown hairs. Poring in Sabah is a common village bamboo, widely known for its edible shoots and useful large culms, and in many places there grows well, sometimes even dominating the landscape where there have been abandoned cultivated fields. The necessity of having an accurate name for the Poring bamboo is underscored by its being so much used in rural circles and the great potential attached to it for more systematic cultivation and exploitation. The identity of the Poring bamboo can only be firmly established by comparison with the type of *G. levis* from the Philippines, the taxon in Peninsular Malaysia and other related species of the genus.

The identity of the Poring bamboo

The Poring bamboo from Sabah (and its conspecifics from Brunei and Sarawak) also has clear differences in floral morphology from the Peninsular Malaysian taxon identified by Holttum (1958) as "G. levis". Although the spikelets are superficially similar in both taxa (being similar in size, 4-5-flowered each and generally short-hairy); the Poring bamboo is distinct in having three lodicules in its flower, paleas with 4-5 veins on their back (between the keels) and 2 veins on each wing, and anther apical cusps with short-triangular spines (Fig. 1). The Peninsular Malaysian taxon has no lodicules in its flower, paleas with 2-4 veins on their back and 1-2 veins on each wing, and anther apical cusps with long spines (Fig. 2). The two taxa thus have a number of vegetative and floral differences and are distinct species (Table 1).

I have examined spikelets of the type of *G. levis* (Merrill: Species Blancoanae no. 310 : D.L. Topping, s. n., March 1914, Luzon, Tayabas Province) at Kew (holotype), Bogor and Leiden (isotypes), and find the spikelet and flower structure to be the same in these specimens as in the Poring bamboo (Fig.1). The Poring bamboo of Sabah is thus correctly identified as *G. levis* (Blanco) Merr.

Table 1. A comparison of two taxa previously identified as *G. levis*, from Sabah and Peninsular Malaysia.

Poring bamboo, Sabah (typical *G. levis*)	Peninsular Malaysian taxon (new species, *G. thoii*)
Culms not white-waxy	Culms white-waxy
Basal culm internodes densely dark-hairy all over	Basal culm internodes scantily dark-hairy at the upper part
Flowers with 3 lodicules	Lodicules absent
Palea 4-5 veined on back, 2-veined on each wing	Palea 2-4 veined on back, 1-2-veined on each wing
Anther apical cusps with short triangular spines hardly 0.05 mm long	Anther apical cusps with long spines c. 0.1 mm long

Merrill (1916) noted that *G. levis* is "apparently very closely allied to and possibly identical with *G. robusta* Kurz" but that species differs in having glumes and lemmas fringed with dark brown hairs, no lodicules and a notched palea apex. In *G. levis* the glumes and lemmas are fringed with pale hairs, there are three lodicules in the flower, and palea apices are acuminate. *G. achmadii* Widjaja, described from Sumatra (Widjaja 1987) and somewhat superficially similar, also differs from *G. levis* by its culm internodes which have

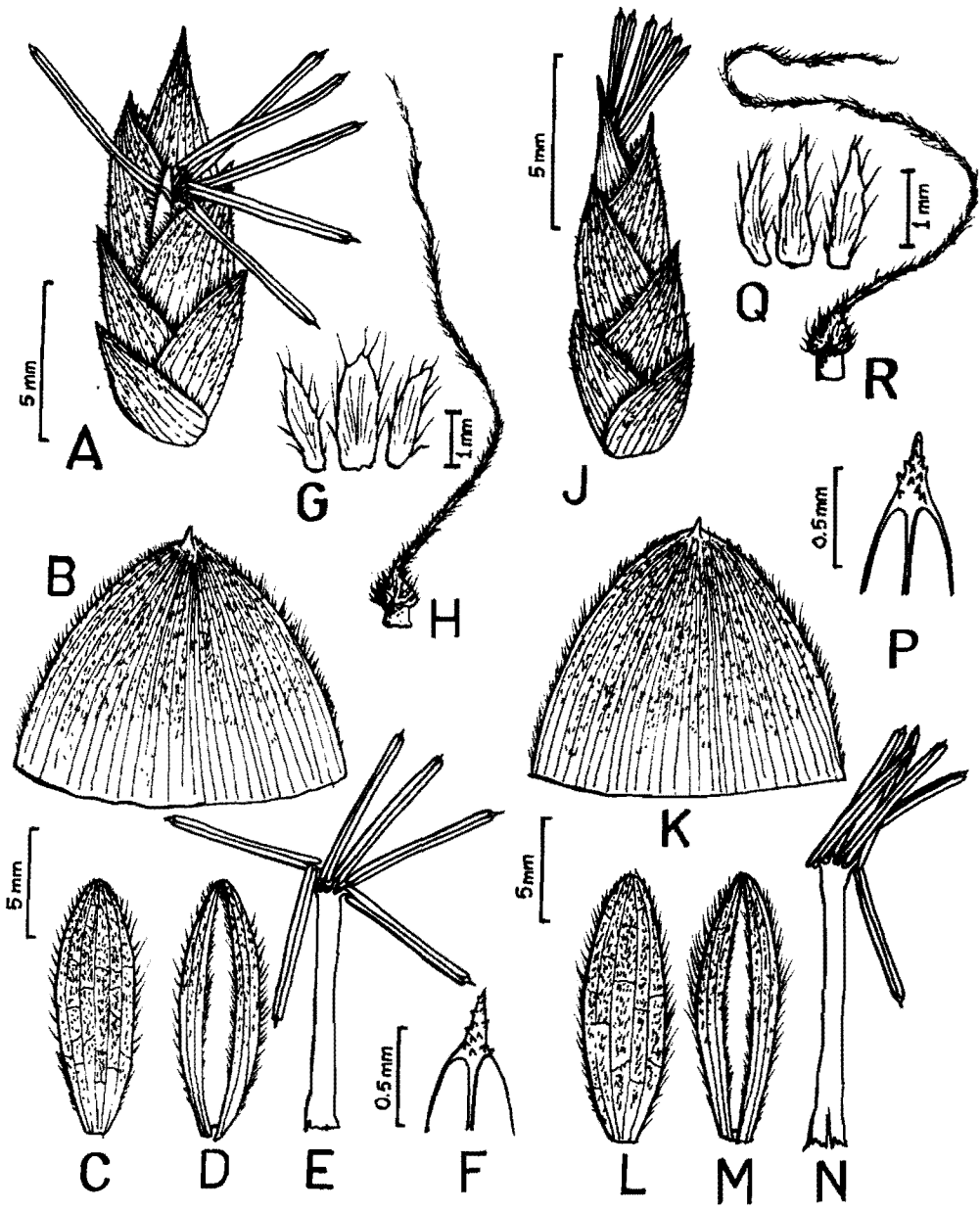

Fig. 1. Spikelets and flower parts of *Gigantochloa levis*, from *Wong s.n.* 27 Feb. 1986, Sabah, Ranau (A-H) and the type, *Merrill*: *Species Blancoanae* no. 310 from the Philippines (J-R). A,J, spikelets; B,K, lemmas; C,L, paleas (back view); D,M, paleas (front view); E,N, androecia; F,P, anther apices; G,Q, lodicule complements; H,R, gynoecia.

whitish hairs at the upper part, the culm-sheath auricles which are raised at the outer ends and slightly curved outward, and the dark-fringed glumes and lemmas. In *G. levis* the culm internode hairs are dark, the culm-sheath auricles are broad lobes which are not raised at the outer ends, and the glumes and lemmas are pale-fringed.

The following specimens of *G. levis* were examined:

PHILIPPINES. LUZON : Tayabas Province, March 1914, flowering, *D.L. Topping* (Merrill: Species Blancoanae No. 310) (holotype K; isotypes BO, L). Bulacan Province, Baliuag, 9 Jan. 1910, flowering, *Merrill & Robinson* 958 (L); Aug. 1910, flowering, *Robinson* Bureau of Science no. 11838 (L). Laguna Privince, Mt Makiling, 11 Dec. 1955, flowering, *Sulit* Phil. Nat. Herb. no. 34084 (L).

BORNEO. SABAH : Ranau, Kiau Village, 27 Aug. 1979, flowering, *S. Dransfield* SD 717 (BO, K, SAN, SAR); Ranau Village, 29 Aug. 1979, vegetative, *S. Dransfield* SD 719 (BO, K, SAN); 27 Feb. 1986, flowering, *K.M. Wong* s.n. (SAN). Tambunan, 11 Sept. 1979, flowering, *S. Dransfield* SD 738 (K, SAN). Keningau, mile 8 Kimanis - Keningau road, 20 June 1978, flowering, *Tiong, Dewol and Nordin* SAN 85900 (SAN). Papar, Kampong Palawan, 28 May 1962, flowering, *Mikil* SAN 30300 (K, L, SAN). **SARAWAK** : 1st Division, road to Padawan, 11 Apr. 1981, flowering, *S. Dransfield* SD 792 (K, KEP, L, SAN, SAR, US). **BRUNEI** : Tutong, Lamunin, Biong Layong, 7 Apr. 1988, flowering, *K.M. Wong* WKM 348 (BRUN, K, L, SAN, SING).

A new species from Peninsular Malaysia

The Peninsular Malaysian taxon has therefore been misidentified with *G. levis* by Holttum (1958) and Widjaja (1987). It is a distinct, as yet undescribed species which can be shown to differ from other *Gigantochloa* species which, like it, have large bristly culm-sheath auricles, flowers without lodicules and yellow anthers (in contrast to maroon anthers, also found in the genus). Thus *G. atter* (Hassk.) Kurz is different by its glabrous lower leaf surfaces, non-waxy culms and dark-fringed glumes and lemmas; *G. atroviolacea* Widjaja by its glabrous lower leaf surfaces, purplish culms, short culm-sheath ligules (to only 2 mm high) and 4-veined palea backs; and *G. robusta* by its non-waxy culms, dark-fringed glumes and lemmas, and notched palea apices. The new species is distinct by its hairy lower leaf surfaces, white-waxy culms, long-bristly ligules to over 1 cm high, pale-fringed glumes and lemmas, and 2-4-veined palea backs (Fig. 2).

The species is here named *Gigantochloa thoii*, in memory of the late Dr. Tho Yow Pong, entomologist and conservationist, who had greatly encouraged me in my work.

Gigantochloa thoii *K.M. Wong* **sp. nov.** *G. levis (Blanco) Merr. affinis sed culmi internodiis ceraceis spicula lodiculis nullis paleis intra costulos 2-4-venosis extus 1-2-venosis antheris apice longe-spinosis differt. Typus : Wong FRI 28972, Selangor, opposite Templar Park, in compound of a stable (holotypus KEP; isotypus K, L, SING).*

Big clumped bamboo, to 16 m tall; rhizomes thick, subfusiform and sympodial in growth. Culms to 12 cm diameter, green, white-waxy, scantily dark-brown hairy at the upper part of

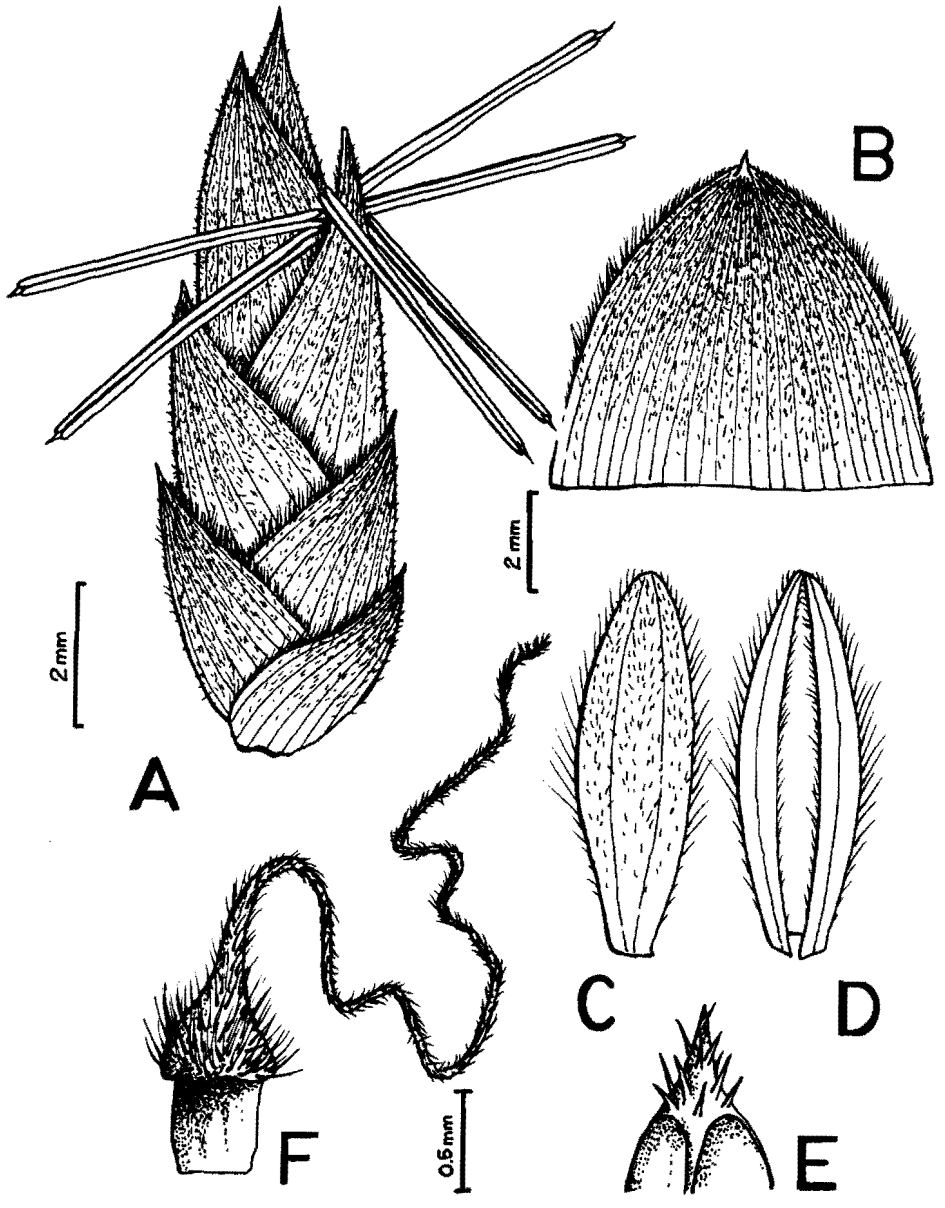

Fig. 2. *Gigantochloa thoii,* spikelet and flower parts. A, spikelet with 3 glumes at the base; B, lemma; C, palea (back view); D, palea (front view); E, anther apex; F, gynoecium. From FRI 28973.

internodes. Branch complement of a dominant primary branch, with (usually) one subdominant secondary branch from its base on each side, and several lesser leafy branchlets from the base of the secondary branches.

Culm sheaths pale to medium green, with dark brown hairs on the back; auricles large lobes to 10 mm high with bristles 10-18 mm long on the margin; ligule 7-22 mm high bearing lacerations with bristle-like tips 5-18 mm long; blade dark purple on lower sheaths, green on upper ones, spreading to reflexed. Leaves softly pale-hairy on the lower surface, 2-6 cm wide, 8-32 cm long; auricles small lobes, fine-bristly on the margin (bristles to 4 mm long); ligules 0.5-1.5 mm long, shortly toothed on the margin.

Inflorescence main axis with pale short-hairy internodes. Pseudospikelets 10-15 mm long, each consisting of 2-3 gemmiferous bracts, 2-3 glumes, 4-5 flowers and a terminal vestigial flower usually represented by an empty lemma; glumes 3-5.5 mm long, acuminate, pale ciliate on the margin, pale short-hairy all over the back, many-veined; lemmas 6.5-10 mm long, shortly mucronate, pale ciliate on the margin, pale short-hairy all over the back, 23-27-veined; paleas as long as lemmas, apex acuminate, keels with cilia to 0.4 mm long, scantily short-hairy on the back between keels, glabrescent on the wings, 2-4-veined between keels, 1-2-veined on each wing; lodicules nil; staminal tube 7-8 mm long, anthers 5.5-6 mm long, yellow, apical cusp c. 0.5 mm long with long spines 0.1 mm long; ovary c. 1 mm long, subcylindric with a thickened dense-ciliate apex; style c. 7 mm long, hairy; stigma one.

SPECIMENS EXAMINED. PENINSULAR MALAYSIA : Selangor, opposite Templar Park, in compound of stable, 3 Oct. 1980, flowering, *K.M. Wong* FRI 28972 (holotype KEP, isotypes K, L, SING), beside stream, 3 Oct. 1980, flowering, *K.M. Wong* FRI 28973 (A, K, KEP, L, SING); Kepong, 28 Aug. 1930, flowering, *Symington* KEP 23138 (KEP, SING), on grounds of the FRI, 16 Oct. 1980, flowering, *K.M. Wong* FRI 28982 (K, KEP, SING), Bukit Lagong path behind house FD 15, 9 Sept. 1969, flowering, *Whitmore* FRI 12567 (KEP), Jalan Development, in compound of shop selling pet fishes, 6 Sept. 1980, flowering, *K.M. Wong* FRI 28958 (A, K, KEP, L, SING). Johore, Kota Tinggi, 5 Nov. 1948, flowering, *le Doux* s.n. (SING). Singapore, Pasir Panjang 6.5 mile, 9 Dec. 1934, flowering, *Holttum* s.n. (SING), cult. in Singapore Botanic Gardens, 26 Aug. 1937, flowering, *Pestana* s.n. (K, SING).

I have also observed this species in the states of Kedah, Kelantan, Penang, Perak, Pahang and Malacca in Peninsular Malaysia. It is known only as a cultivated species, of unknown origin. *G. thoii* is usually planted as solitary household clumps in villages and rural areas, and sometimes as small plots. In 1983 I visited a small holding of planted *G. thoii* in Kepong, along the road to the Forest Research Institute. The owner, who was tending about 4.5 ha of this species and marketing the fresh shoots to the Central Market in Kuala Lumpur, informed me that his lot dated back to before 1957. He observed peaks in shoot yield around July - August of each year, with a production of up to 1000 katties (c. 600 kg) per week; off-peak production was estimated at 200-400 katties (c. 1200-2400 kg) per week. He planted clumps at about 3.5 m spacing on undulating to flat ground but did not divulge his fertilizer application. The farm lot does not exist any more, as the site has been given over to housing development.

ACKNOWLEDGEMENTS

I thank the curators and keepers of the Bogor, Kew, Kepong, Leiden, Sandakan and Singapore herbaria for facilitating consultation of specimens in their care. Dr. J. Dransfield kindly corrected the Latin diagnosis; he and Dr. S. Dransfield have been helpful with their comments on the work carried out.

REFERENCES

Holttum, R.E. (1958) The bamboos of the Malay Peninsula. Gardens' Bulletin, Singapore 16 : 1-135.

Merrill, E.D. (1916) On the identity of Blanco's species of *Bambusa*. American Journal of Botany 3 : 58-64.

Widjaja, E.A. (1987) A revision of Malesian *Gigantochloa* (Poaceae - Bambusoideae). Reinwardtia 10(3) : 291-380.